DATA TRANSMISSION METHOD FOR HYBRID ARQ TYPE II/III DOWNLINK OF WIDE-BAND RADIO COMMUNICATION SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to a data processing method for hybrid automatic request for repeat (hereinafter, referred to as an ARQ) type II/III on a downlink of a wide-band radio communication system; and, more particularly, to a method for processing a radio link control—protocol data unit (RLC-PDU) and a HARQ-RLC-Control-PDU, which is extracted from the RLC-PDU, by using a transport channel such as a downlink shared channel (DSCH), wherein the RLC-PDU is used in W-CDMA based on a next generation mobile communication network, such as an international mobile telecommunication (IMT)—2000 and a universal mobile telecommunications system (UMTS), and to a computer readable recording media having program instructions for carrying out the method

DESCRIPTION OF THE PRIOR ART

[0002] Terms used in this specification will be described.

[0003] "A radio network controller—radio link control (RNC—RLC)" is a radio link control protocol level entity of a radio network controller (RNC).

[0004] "A radio network controller—medium access control dedicated entity (RNC—MAC-D)" is a medium access control protocol level dedicated entity of a radio network controller (RNC).

[0005] "A radio network controller—medium access control common/shared entity (RNC—MAC-C/SH)" is a medium access control protocol level terminal common/shared entity of a radio network controller (RNC).

[0006] "Node B—L1" is a physical channel layer entity of a node B. The node B represents a base transceiver station (BTS) in an asynchronous IMT-2000 system. In this specification, the term node B is used the same as the term "base transceiver station" (BTS).

[0007] "User equipment—L1 (UE-L1)" is a physical channel layer entity of a user equipment (UE) (or a mobile station).

[0008] "User equipment—medium access control common/shared entity (UE—MAC-C/SH)" is a medium access control protocol level terminal common/shared entity of a user equipment (UE) (or a mobile station).

[0009] "User equipment—medium access control dedicated entity (UE—MAC-D)" is a medium access control protocol level terminal entity of a user equipment (UE) (or a mobile station).

[0010] "User equipment—radio link control (UE—RLC)" is a radio link control protocol level entity of a user equipment (UE) (or a mobile station).

[0011] "User equipment—radio resource control (UE—RRC)" is a radio resource control protocol level entity of a user equipment (UE) (or a mobile station).

[0012] "Iub" denotes an interface between the RNC and the Node B (BTS).

[0013] "Iur" denotes an interface between the RNC and another RNC.

[0014] "Uu" denotes an interface between the Node B and the UE.

[0015] "Logical channel" is a logical channel used for transmitting and receiving data between the RLC protocol entity and MAC protocol entity.

[0016] "Transport channel" is a logical channel used for transmitting and receiving data between the MAC protocol entity and a physical layer.

[0017] "Physical channel" is a practical channel used for transmitting and receiving data between a mobile station and a BTS.

[0018] When transporting the data from a radio network of a UMTS terrestrial radio access network (UTRAN) to the mobile station (MS), a Hybrid ARQ type I/II which has superior throughput than a Hybrid ARQ type I may be used.

[0019] **FIG. 2** is a diagram showing a general wide-band radio communication network (W-CDMA). A UTRAN environment is used as an example in this drawing.

[0020] As described in **FIG. 2**, the UTRAN includes a user equipment (UE or MS) **10**, an asynchronous radio network **20** and a radio communication core network **30**, such as a GSM-MAP core network.

[0021] A Hybrid ARQ type II/III is provided between the UE and the asynchronous radio network **20**. When a received data has an error, the receiver requests that the data be retransmitted by the transmitter.

[0022] A protocol stack structure in the above-referenced system is illustrated in **FIG. 4**.

[0023] **FIG. 3** is a diagram showing a general UTRAN. In **FIG. 3**, the Iu is an interface between the radio communication core network **300** and the asynchronous radio network **200**, and, the Iur means a logical interface between radio network controllers (RNC) of the asynchronous radio networks **200** and the Iub shows an interface between the RNC and each Node B. Uu designates a radio interface between the UTRAN and the UE.

[0024] Node B is a logical node, which is responsible for a radio transmission/receiving from one or more cells to the UE.

[0025] Generally in the UTRAN, if received data has an error, the receiver requests re-transmission of the data by the transmitter, using an automatic repeat request (ARQ) method. The ARQ methods are divided to ARQ type I, II and III, and technical characteristics of each type are described below.

[0026] The ARQ is an error control protocol, which automatically senses an error during transmission and then requests re-transmission of the error-containing block. That is, the ARQ is a data transmission error control method, and when an error is detected, automatically generates a re-transmission request signal.

[0027] The ARQ method is used in the UTRAN for a transmission packet data. The receiver requests the transmitter to re-transmit an error-generated containing packet. When using the ARQ method, if the number of re-transmit